

### Abstract

A proton conducting membrane having a high ionic conductivity and an excellent high temperature dimensional stability which can perform stably even at high temperatures, a method for producing the same and a solid polymer-based fuel cell comprising same are provided. In other words, the present invention concerns a method for producing a proton conducting membrane having a crosslinked structure formed by a silicon-oxygen covalent bond and having a sulfonic acid-containing crosslinked structure represented by the following formula (1) therein, which comprises a first step of preparing a mixture containing a mercapto group-containing oligomer (A) having a plurality of mercapto groups and a reactive group which can form a Si-O-Si bond by condensation reaction, a second step of forming said mixture into a membrane, a third step of subjecting said membrane-like material to condensation reaction in the presence of a catalyst to obtain a crosslinked gel and a fourth step of oxidizing the mercapto group in the membrane so that it is converted to a sulfonic acid group, a proton conducting membrane obtained by same and a fuel cell comprising same:

